Course Title: Computer Graphics
Course no: CSC-254---------- Full Marks: 60+20+20
Credit hours: 3 ---------- Pass Marks: 24+8+8
Nature of course: Theory (3 Hrs.) + Case Study
Course Synopsis: This Graphics hardware, software, and applications, data structures for graphics, graphics languages, models for 2D and 3D objects, clipping, hidden surface elimination, depth buffer, raster graphics, shading rendering, splines tools.
Goal: The objective of this course is to understand the theoretical foundation of 2D and 3D graphics.

Course Contents:

Unit 1. ---------- 5 Hrs.
Introduction, Advantage of Computer Graphics, Areas of Applications, Hardware and Software for Computer Graphics. (Hard Copy, Display Technologies), Random Scan Display System, Video Controller, Random Scan Display Processor. Raster Graphics, Scan Conversion Algorithms (Line, Circle, Ellipse), Area Filling (Rectangle, Ellipse), Clipping (Lines, Circle, Ellipse), Clipping Polygons.
Unit 2. ---------- 10 Hrs.
Geometrical Transformations, Homogenous coordinates, 2D and 3D Transformations, Matrix Representations, Window to View Port Transformation. 3D Viewing, Projections, Mathematics of Projections.
Unit 3. ---------- 15 Hrs.
3D Object Representation, Representing Curves and Surfaces, (Polygon Meshes, Parametric Cubic Curves, Quadratic Surface), Solid Modeling (Sweep Representation, Boundary Representation, Spatial Partitioning Representation)
Unit 4. ---------- 12 Hrs.
Visible Surface Determination, Various Techniques, Algorithms for Visible Surface Detection, (Z- Buffer, List priority, Scan Line Algorithms), Shading and Illumination models.
Unit 5. ---------- 3 Hrs.
Introduction to virtual Reality and Animation.
Laboratory works: All algorithms covered in the text to be implemented in PHIGS/OpenGL in C/C++.

Text / References books:
Foley, J. D., A. V. Dam, S. K. Feiner, J. F. Hughes, Computer Graphics Principle and Practices, Addison Wesley Longman, Singapore Pvt. Ltd., 1999.

Hearn Donald, M. P. Baker, Computer Graphics, 2E, Prentice Hall of India Private Limited, New Delhi, 2000.